

Appl. No. 10/687,671
Amdt. dated March 07, 2007
Reply to Office action of December 07, 2006

Amendments to the Drawings

The attached sheet of drawings includes changes to Fig. 3. The changes are made to add texts AAGC, ECHO and NEXT to the elements 15, 31 and 32. This sheet replaces the original sheet of Fig. 3. No new matter is introduced.

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Attachment: Replacement Sheet

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REMARKS/ARGUMENTS

Claims 1-9 and 11-20 remain pending in this application. Claim 10 is cancelled without prejudice. Claims 14-20 are newly added without entering any new matters.

- 5 Claims 1 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Agazzi et al. (U.S. Patent Application No. 2003/007581)

Claim 1 recites:

- 10 Claim 1 (Currently Amended): A ~~Feedforward~~ feed-forward equalizer (FPE) of a communication system comprising:
an adaptive filter for filtering a receiving signal according to a transfer function including a plurality of ~~adjustable constants~~ parameters to eliminate a pre-cursor inter-symbol interference (pre-ISI) of the receiving signal, the adaptive filter comprising:
15 a plurality of delay elements for generating a plurality of delay signals according to the receiving signal;
 a plurality of multiplier for respectively multiplying the receiving signal and the delay signals by the parameters and thereby generating a plurality of multiplied signals, wherein at least one of the parameters remains fixed
20 while the other parameters are adjusted to converged values, so as to accelerate the convergence of the communication system; and
 a summing circuit for summing the multiplied signals to generate a filtered receiving signal; and
25 a digital auto-gain controller (DAGC) coupled to the adaptive filter for adjusting the magnitude of the filtered receiving signal according to the transfer function;
 wherein a center multiplier among the multipliers is designated to multiply

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one of the delay signals by the fixed parameter to generate one of the multiplied signals.

~~wherein the adjustable constants include a main tap and the value of the main tap is predetermined.~~

5 (Emphasis Added)

Applicants assert that the amended claim 1 is patentable over Agazzi et al. because Agazzi et al. fail to teach or suggest a combination of all of the limitations recited in claim 1. The claimed invention discloses a feed-forward equalizer comprising an adaptive
10 filter and a digital auto-gain controller. The adaptive filter comprises a plurality of multipliers operating according to a plurality of parameters, in which at least one parameter remains fixed while the other parameters are adjusted to converged values. A center multiplier among the multipliers then operates according to the fixed parameter.

15 Agazzi et al., in the contrast, fail to disclose his feed-forward equalizer (26) including an adaptive filter as claimed in claim 1. Two filters, the inverse partial response (IPR) filter (30) and pulse shaping (P-S) filter (28), are comprised by the feed-forward equalizer (26) of Agazzi et al. (Agazzi et al.: Fig. 2) but none of them teaches or suggests all of the limitations of the claimed adaptive filter. Although Agazzi et al. disclose an
20 adaptive FIR filter as shown in Figs. 29A, 29B or 29C, the adaptive FIR filter is used to implement the echo canceller (232) and the NEXT cancellers (229, 230 and 231) instead of the feed-forward equalizer (26). Besides, all of the coefficients C_i of the adaptive FIR filter of Figs. 29A, 29B or 29C of Agazzi et al. are trained and converge to stable values (Agazzi et al.: Page 22, Paragraph [0238]) while the claimed invention
25 claims at least one of the parameters remaining fixed while the other parameters are adjusted to converged values. Moreover, Agazzi et al. nowhere disclose or imply that the adaptive FIR filter of Figs. 29A, 29B or 29C includes a center multiplier designated to operate according to any fixed coefficients C_i . Therefore, for at least the reasons

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mentioned above, Agazzi et al. fail to teach or suggest the claimed invention. As claims 2-6 are dependent upon claim 1, if claim 1 is found to be allowable, so too should the dependent claims.

5 The amend claim 7 is patentable over Agazzi et al. because of similar arguments applied to claim 1. As claims 8-9 and 11-13 are dependent upon claim 7, if claim 7 is found to be allowable, so too should the dependent claims.

Claims 14-20 are newly added without entering any new matters

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Claim 14 recites:

Claim 14 (New): A feed-forward equalizer (FFE) of a communication system comprising:

a multi-tap filter for filtering a receiving signal, comprising:

15 a plurality of delay elements coupled in series for generating a plurality of delay signals according to the receiving signal, each of the delay signals corresponding to a different delay, one of the delay signals corresponding to a middle delay among the different delays;

20 a plurality of multiplier for respectively multiplying the receiving signal and the delay signals by a plurality of parameters and thereby generating a plurality of multiplied signals, wherein at least one of the parameters remains fixed while the other parameters are adjusted to converged values, so as to accelerate the convergence of the communication system;

25 and

a summing circuit for summing the multiplied signals to generate a filtered receiving signal; and

a digital auto-gain controller (DAGC) coupled to the adaptive filter for adjusting the magnitude of the filtered receiving signal according to the parameters.

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(Emphasis Added)

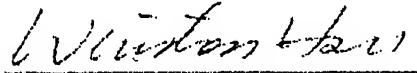
Applicants assert that the amended claim 14 is patentable over Agazzi et al. because Agazzi et al. fail to teach or suggest a combination of all of the limitations recited in
5 claim 14. Agazzi et al. disclose a feed-forward equalizer (26) which includes two filters, the inverse partial response (IPR) filter (30) and pulse shaping (P-S) filter (28), but none of the two filters teaches or suggests all of the limitations of the claimed adaptive filter. Although Agazzi et al. disclose an adaptive FIR filter as shown in Figs. 29A, 29B or 29C, the adaptive FIR filter is used to implement the echo canceller (232) and the NEXT
10 cancellers (229, 230 and 231) instead of the feed-forward equalizer (26). Besides, all of the coefficients C_i of the adaptive FIR filter shown in Figs. 29A, 29B or 29C of Agazzi et al. are trained and converge to stable values (Agazzi et al.: Page 22, Paragraph [0238]) while the claimed invention claims at least one of the parameters remaining fixed when the other parameters are adjusted to converged values.
15 Therefore, for at least the reasons mentioned above, Agazzi et al. fail to teach or suggest the claimed invention. As claims 15-20 are dependent upon claim 14, if claim 14 is found to be allowable, so too should the dependent claims.

As all of the pending claims 1-9 and 11-20 are in condition of allowance,
20 consideration of pending claims is respectfully requested.

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Sincerely yours,



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- 10 Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 13 hours behind the Taiwan time, i.e. 9 AM in D.C. = 10 PM in Taiwan.)